CLAIMS:

1. A method for controlling the power delivered to a discharge light by an alternating (AC) power signal via a ballast circuit which resonates at a predetermined value of the frequency of said alternating power signal, the method including:

   maintaining the value of the frequency of said alternating power signal to be always less than said predetermined value after the discharge light has struck.

2. A method according to claim 1 including causing the frequency of the power signal to approach the arc frequency at which the discharge light enters the third discharge state, in which discharge the light enters an arc discharge condition, and controlling the power signal frequency to prevent entry into that state.

3. A method according to any preceding claim including controlling the frequency of the power signal so as to reduce the difference between the frequency of the power signal and the arc frequency, in which discharge the light enters an arc discharge condition, as much as possible without causing the discharge light to enter an arc discharge state.

4. A method according to any preceding claim including varying the frequency of the power signal according to a measure of the power delivered to, or converted in to radiant energy by, the discharge light.

5. A method according to claim 4 including monitoring the amount of power converted by the discharge light or delivered to it by the ballast circuit, and adjusting the alternating power signal in response to variations in the monitored power so as to maximise the power delivered to or converted by the discharge light.

6. A method according to any preceding claim including adjusting the frequency of the alternating power signal so as to maximise the proportion of the power in the power signal received by the ballast circuit which is delivered to the discharge light thereby.

7. A method according to any preceding claim including decreasing the frequency of the AC power signal in response to decreases in the delivered power thereby to increase the power delivered to the discharge light.

8. A method according to any preceding claim including adjusting the AC power signal frequency when responding to variations in the delivered power so as to cause a stabilisation in delivered power.

9. A method according to claim 8 including increasing the frequency of the AC power signal in response to increases in the delivered power, and decreasing the frequency of the AC power signal in response to decreases in the delivered power, thereby to stabilise the delivered power.

10. A method according to any preceding claim including incrementally changing the frequency of

the AC power signal to maximise or stabilise the power delivered to the discharge light, wherein the frequency increments are controlled so as to not exceed a predetermined maximum increment value

5   selected to prevent plasma drop-out in response to an increment in said frequency.

11.   A method according to any preceding claim including monitoring the value of a selected

10   property of the alternating power signal: as input to the ballast circuit; and/or, as present within the ballast circuit; and/or, as delivered to the discharge light, and deriving from the monitored value of the selected property a measure of the

15   power delivered to the discharge light.

12.   A method according to Claim 11 in which said selected property is the value of the electrical currents both as present within the ballast circuit

20   and as concurrently delivered to the discharge light.

13.   A method according to any of claims 6 to 12

25   including sampling values of said selected property of the alternating power signal once within separate successive sampling periods, wherein each sampling period is no greater in duration than one half of the duration of a single cycle of said alternating

30   power signal.

14.   A method according to any of claims 2 to 13 including adjusting any one or more of the frequency, amplitude, or phase of the alternating

power signal when adjusting that signal in response
to variations in the delivered power.

15.   A method according to any preceding claim
including maintaining the frequency of the AC power
signal at a value sufficiently low that during at
least a part of a cycle of the AC power signal an
inductor means of the ballast circuit is caused to
saturate, whereby the magnitude of the back-e.m.f.
induced thereby is less than a predetermined
threshold value during said part of said cycle.

16.   A power controller for controlling the power
delivered to a discharge light by an alternating
(AC) power signal via a ballast circuit which
resonates at a predetermined value of the frequency
of said alternating power signal, including:
a power control means arranged to control the AC
power signal to maintain the value of the frequency
of said AC power signal to be always less than said
predetermined value after the discharge light has
struck.

17.   A power controller according to claim 16 in
which the power control means is arranged to vary
the frequency of the power signal to approach the
frequency at which the discharge light enters the
third discharge state, in which discharge the light
enters an arc discharge condition, and to control
the power signal frequency to prevent entry into
that state.

18.   A power controller according to any of claims
16 and 17 in which the power control means is

arranged to control the frequency of the power signal so as to reduce the difference between the frequency of the power signal and the arc frequency, at which discharge the light would enter an arc discharge condition, as much as possible without causing the discharge light to enter an arc discharge state.

19.   A power controller according to any of claims 16 to 18 in which the power control means is arranged to vary the frequency of the power signal according to a measure of the power delivered to, or converted in to radiant energy by, the discharge light.

20.   A power controller according to Claim 16 in which the power control means is arranged to monitor the amount of power converted by the discharge light, or delivered to it by the ballast circuit, and to adjust the AC power signal in response to variations in the monitored power so as to maximise the power converted by, or delivered to, the discharge light.

21.   A power controller according to any claim 16 to 20 arranged to adjust the frequency of the alternating power signal so as to maximise the proportion of the power in the power signal received by the ballast circuit which is delivered to the discharge light thereby.

22.   A power controller according to any of preceding claims 16 to 21 arranged to decrease the frequency of the AC power signal in response to

decreases in the delivered power thereby to increase the power delivered to the discharge light.

23.   A power controller according to any of preceding claims 16 to 22 arranged to adjust the AC power signal frequency when responding to variations in the delivered power so as to cause a stabilisation in delivered power.

24.   A power controller according to claim 23 arranged to increase the frequency of the AC power signal in response to increases in the delivered power, and decrease the frequency of the AC power signal in response to decreases in the delivered power, thereby to stabilise the delivered power.

25.   A power controller according to any of preceding claims 16 to 24 arranged to incrementally change the frequency of the AC power signal to maximise or stabilise the power delivered to the discharge light, wherein the frequency increments are controlled so as to not exceed a predetermined maximum increment value selected to prevent plasma drop-out in response to an increment in said frequency.

26.   A power controller according to Claim any of claims 16 to 25 in which the power control means includes power monitor means arranged to monitor the value of a selected property of the AC power signal: as input to the ballast circuit; and/or, as delivered to the discharge light, and to derive from the monitored value of the selected property a

measure of the power delivered to the discharge light.

27.   A power controller according to Claim 26 in which said selected property is the value of the electrical current delivered to the discharge light.

28.   A power controller according to any of claims 16 to 27 in which the power monitor means is arranged to sample values of said selected property of the AC power signal once within separate successive sampling periods, wherein each sampling period is no greater in duration than the one half of the duration of a single cycle of said AC power signal.

29.   A power controller according to any of claims 16 to 28 in which the power control means is arranged to adjust any one or more of the frequency, amplitude, or phase of the AC power signal when adjusting that signal in response to variations in the delivered power.

30.   A power controller according to any of preceding Claims 16 to 29 in which the power control means is arranged to maintain the frequency of the AC power signal at a value sufficiently low that during at least a part of a cycle of the AC power signal an inductor means of the ballast circuit is caused to saturate, whereby the magnitude of the back-e.m.f. induced thereby is less than a predetermined threshold value during said part of said cycle.

31.   A power controller according to any of preceding claims 16 to 30 wherein an inverter means is arranged to receive a DC power input signal and to generate said alternating (AC) power signal therefrom for powering the discharge light via a ballast circuit, wherein the power control means includes an inverter control means arranged to generate inverter control signals for controlling said inverter so as to control the AC power signal generated thereby.

32.   A power controller according to claim 31 wherein said power control means includes said inverter means.

33.   A method for controlling the power delivered to a discharge light from a source of direct-current (DC) power, the power being delivered via a signal inverter and subsequent ballast circuit as an alternating (AC) power signal, the method including: monitoring variations in the DC power input to the signal inverter, and varying the frequency of the alternating power signal according to detected variations in the DC power input, thereby to control variations in the power supplied to the discharge light via the ballast circuit.

34.   A method according to Claim 33 including varying the frequency of the AC power signal so as to minimise variations in the power supplied to the discharge light via the ballast circuit.

35.   A method according to Claim 34 in which said variations in the frequency of the alternating output signal are made according to the signal response of the ballast circuit via which the alternating power signal is delivered to the light.

36.   A method according to any of preceding claims 33 to 35 in which the ballast circuit has a frequency response which resonates at a predetermined frequency of the AC power signal, and the method includes varying the frequency of the AC power signal: to recede from the resonance frequency when the DC power input is determined to have fallen; and, to approach the resonance frequency when the DC power input is determined to have risen.

37.   A method according to any of claims 33 to 36 including determining an average value of the DC power input to the inverter over a predetermined averaging period, and varying the frequency of the AC power signal according to a difference value being the difference between an instantaneous value of the DC power input and the average value thereof.

38.   A method according to Claim 37 including determining the oscillation period of the variations in the DC power input, whereby the predetermined averaging period is of a duration substantially equal to the oscillation period.

39.   A method according to any of claims 37 to 38 including storing a plurality of separate and successive of the aforesaid difference values for

the purposes of future use in varying the frequency of said AC signal.

40.   A power controller for controlling the power delivered to a discharge light from a source of direct-current (DC) power, the power being delivered via a signal inverter and subsequent ballast circuit as an alternating (AC) power signal, the power controller including:

control means arranged to monitor variations in the DC power input to the inverter means, and to vary the frequency of the alternating power signal according to detected variations in the DC power input, thereby to control variations in the power supplied to the discharge light via the ballast circuit.

41.   A power controller according to Claim 40 in which the control means is arranged to vary the frequency of the AC power signal so as to minimise variations in the power supplied to the discharge light via the ballast circuit.

42.   A power controller according to Claim 40 or 41 in which the ballast circuit resonates at a predetermined frequency of the AC power signal, and the control means is arranged to vary the frequency of the AC power signal: to recede from the resonance frequency when the DC power input is determined to have fallen; and, to approach from the resonance frequency when the DC power input is determined to have risen.

43.   A power controller according to any of Claims
40 to 42 in which the control means is arranged to
determine an average value of the DC power input to
the inverter over a predetermined averaging period,
and to vary the frequency of the AC power signal
according to a difference value being the difference
between an instantaneous value of the DC power input
and the average value thereof.

44.   A power controller according to Claim 43 in
which the control means is the control means is
arranged to determine the oscillation period of the
variations in the DC power input, whereby the
predetermined averaging period is of a duration
substantially equal to the aforesaid oscillation
period.

45.   A power controller according to any of Claims
40 to 44 in which the control means is arranged to
store a plurality of separate and successive
difference values generated thereby for future use
by the power controller in varying said AC signal
frequency.

46.   A method for controlling the power delivered to
a discharge light in use by an alternating (AC)
power signal via a ballast circuit, the method
including; monitoring the ambient illumination level
in the vicinity of the light, and adjusting the
frequency of said alternating power signal to adjust
the power delivered to, and ultimately radiated by,
the light thereby to maintain the ambient
illumination level at a substantially constant
value.

47.   A method according to Claim 46 in which the ballast circuit resonates at a predetermined frequency of the AC power signal, and the control method includes reversibly adjusting the frequency of the alternating output signal so as to approach the value of the resonance frequency thereby to reduce the power delivered to, and radiated by, the discharge light.

48.   A power controller for controlling the power delivered to a discharge light in use by an alternating (AC) power signal from an AC power source via a ballast circuit, the controller including; control means arranged to monitor the ambient illumination level in the vicinity of the light, and to adjust the frequency of the AC power signal to adjust the power delivered to, and ultimately radiated by, the light thereby to maintain the ambient illumination level at a substantially constant value.

49.   A power controller according to Claim 48 in which the ballast circuit resonates at a resonance frequency value of the frequency of the AC power signal, and the control means is operable to reversibly adjust the frequency of the AC power signal so as to approach the value of the resonance frequency thereby to reduce the power delivered to, and radiated by, the discharge light.